MA00218

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ORDER#:
32172
2.12 HP
34.900 RPM

XTEC

Z.21R SPEC.3 PULLSTART

USER GUIDE

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Dear Customer,

thank you for your trust in this LRP product. By purchasing a LRP nitro engine, you have chosen a high-performance and highly sophisticated product, which doesn´t make any compromise between maximum performance and easy tuneability. We hope you enjoy your new engine.

Please read the following instructions carefully before you start using your LRP Z.21R Spec.3 Pullstart engine. This user guide contains important notes for the installation, the safety, the use and the maintenance of this product. Thus protecting yourself and avoid damages of the product.

Proceed according to the user guide in order to understand your LRP Z.21R Spec.3 Pullstart engine better. Please take your time as you will have much more joy with your product if you know it exactly.

This user manual shall be kept in a safe place. If another customer is using this product, this manual has to be handed out together with it.

1. SPECIFICATION

Engine size	.21 (3.49ccm)
Exhaust	Rear
Bore	16.40mm
Stroke	16.40mm
Liner	ABC
Number of ports	3+1 (3x transfer-, 1x exhaust-port)
Crankshaft	12.0mm / 9.0mm bore / SG-shaft Lightened crankshaft pin area
Crankcase	Black coloured LRP XTEC .21 Heavy Duty Competition
Piston	Specially lightened, high-silicium alloy
Connecting Rod	Oversized and made from extra stron aluminium
Glowplug	LRP Standard style R5 (No. 35051) included
Carburetor	XTEC PowerCarb 14S-2 with 7.5mm venturi Made from lightweight Aluminium
Power Output*	2.12 PS
Max. RPM*	34.900
Weight	410g

*Figures may vary depending on used fuel, exhaust system and tuning.

2. FUEL

Never use regular gasoline or airplane fuel. Use fresh 2-stroke model car fuel only! We recommend using our line of LRP Energy Power fuels (No. 35711: 25% 1L / No. 35731: 25% 3,5L). For the LRP Z.21R Spec.3 Pullstart, we recommend a fuel with 25% nitro. Never exceed 36% nitro. A higher nitro content will decrease your engine's lifetime.

3. AIRFILTER

A good airfilter is very important for the life of your engine. Never run without an airfilter, as quick and permanent damage will result! Don't forget to impregnate the airfilter with a suitable oil before usage. Carefully clean the airfilter at least after every tenth tank. Replace the airfilter every 3 litres (~1 gallon) of usage.
We recommend the use of our LRP Hi-Flow 2-Stage oval airfilter (No. 36565) together with our LRP Hi-Flow airfilter oil (No. 36590).

4. GLOWPLUG

Use only Standard style glow-plugs for this engine. We recommend using our line of high-quality LRP Platinum / Iridium glowplugs (No. 35031 - No. 35061, availabe as R3 to R6). Check them frequently and never run with worn-out or old glow-plugs since they could damage your engine. They turn dull when your engine was too lean and should be replaced. They should stay bright like chrome. If the glowplugs wear out too fast, an additional 0.1mm shim between burnroom and liner is recommended. Whenever you have trouble with the engine stalling for no reason, replace the glow-plug first!

TIP: Under normal conditions, use a LRP Platinum / Iridium R5 (No. 35051) plug for the LRP Z.21R Spec.3 Pullstart engine. When using fuel with higher Nitro content or at very hot days, use a LRP Platinum / Iridium R6 (No. 35061) plug.

5. EXHAUST SYSTEM

Never run without a pipe since this will cause excessive overheating and may damage your engine. A good pipe has a very huge effect on the performance of a 2-stroke engine. For the LRP Z.21R Spec.3 Pullstart, we recommend using our LRP Enduro-46 1/8 Off-Road exhaust system (No. 36250) for maximum performance.

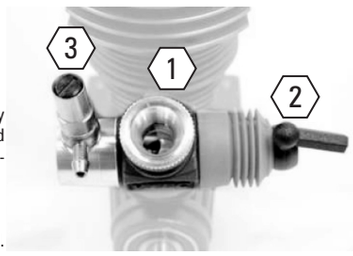
6. PULLSTARTER

Always pull the handle straight and don't let the cord rub on anything. Do not fully extent the cord as this may abuse and damage the pull starter (using about 2/3 of the complete length of the cord is enough to start your engine). Don't let fuel get in contact with the pull starter as this may weaken it. The Pull Starter is designed to start the engine running in a counterclockwise rotation. **Forcing the flywheel clockwise will cause sever damage to the pull starter.**

7. CARBURETOR

The factory settings of the engine are as following and are a good starting point for you, if you are not satisfied with your carburetor settings. Turn in the needles completely (Caution: Do not overtighten them!) and loosen them the required number of turns again:

- Mid range: **3,0 turns**
- Main: **3,0 turns**



Idle screw (No.1):
Adjusts the air flow when carburetor is fully closed. Turn CW for higher idle-speed and CCW for lower idle-speed. Should be open 0.5-1.0mm.

Mid range needle (No.2):
Adjusts the mid/low-speed flow rate of the fuel. Turn CW for leaner and CCW for richer setting.

Main speed needle (No.3):
Adjusts the main flow rate of the fuel (when the throttle is opened significantly). Turn CW for leaner and CCW for richer setting.

8. RUN-IN

Proper run-in of the engine is a very important step in ensuring that you get the highest performance and lifetime of your engine. Take your time for proper run-in. **Do not use run-in benches, but use your car for run-in.** Use the same fuel as you will be using for the life of the engine. Special run-in fuel is not needed. If your engine doesn't start easily you may try loosen the glow-plug by ½-turn to decompress the engine and try again. Don't forget to tighten the glow-plug again once the engine started!

Procedure:

- Start the engine and set the main-needle very rich, i.e. excessive smoke coming from the muffler.
- Let the engine idle for 2mins first to warm it up.
- Now start driving your car, it will be slow and sluggish, but this is an important step.
- Do not allow the engine to rev-up too high, run the engine at half speed on the straightaway.
- The engine should not be too cold and not too hot during run-in, 70-80°C (160-180°F) is perfect.
- Let the engine cool down for 15mins after each tank during the run-in period.
- We recommend doing so for 5 tanks of fuel before you start tuning your engine.

9. TUNING

It never hurts to have the mixture too rich, but NEVER let the mixture get too lean. Always tune from rich to lean. If in doubt, richen it up first! Never try to tune a cold engine, run 2-3 minutes to get the engine up to running temperature before doing any adjustments!

Basic tuning procedure is as follows:

1. Set the engine's idle speed up slightly higher than normal.
2. Start tuning your engine with the settings too rich.
3. Always tune main-speed needle (top-end) first.
4. Tune mid-range needle next.
5. Reset idle speed screw.

Procedure:

1. Set the idle speed so your engine doesn't stall (slightly higher then normal).
2. Go to the track with the main-needle set too rich, there should be heavy smoke coming from the muffler now.
3. Tune the engine by leaning the main-needle 1/8 turn at a time (turn clockwise).
   - Your goal will be that the engine will just reach maximum RPM on the straightaway.
   - Open the main-needle again by an 1/8 turn (turn counter-clockwise) when you have reached that point. This should be the perfect setting for the main-needle. Temperature of 95-105°C (200-225°F).
   - If the main-needle is set too lean, the engine will overheat and will not accelerate smoothly. **If this happens, immediately stop the engine and richen the main-needle (counterclockwise) 1/4 turn before a new attempt.**
4. Adjust the mid-range needle now. Run 3 full laps, stop the car near you and let it idle for 5secs. „Push off". It should have slightly richened up (idle rpm gets lower), but still accelerate quickly. If it died before the 5secs, check the following:
   - If the rpm constantly decreases and finally the engine stops, the mid-range needle is too rich.
   - If the idle-speed increases during idle, the mid-range needle is too lean.
5. You may have to re-adjust the idle-speed now. If it idles too high, the clutch may not release completely and you will lose „snap" off the corners. If it idles too low, it may stall at the start, or at the end of the straightaway when you release the throttle.

Ways to measure the engine temperature:

- Temperature gauge method (recommended): Pull in quickly and immediately take a temperature reading. Place the gauge directly over the engine pointed at the glow plug.
- Spit method: Pull in quickly and immediately put some spit on the engine's head. The spittle should just slowly boil off (2-3secs). It should not dance around as if it were on a hot griddle, nor should it lay there and steam.

10. AFTER RUN

Use after-run oil to keep everything lubricated after you have finished your day. After-run oil helps for an easy start the next time and protects your internals against rust. Use only „after-run oil" specially formulated for R/C engines. Do not use silicone shock oil or similar as they will seriously harm your engine. We recommend to use our LRP After-Run oil (No. 37910), which you should use regularly after using your engine.

Procedure:
First let the tank run completely empty at idle until it runs out of fuel (try re-starting it several times), next put a few drops down the open carburetor and a few drops down the glow plug hole. Spin it over with the Pullstart at least 5 times and you are done.

11. MAINTENANCE

Treat your engine with care and check it frequently. Due to the extremely high RPM this engine produces, any fault can cause serious damage. All moving parts inside the engine are subject to wear, you must know if a piston/liner/conrod has worn out and if they need to be replaced. If you replace one part, please check if everything else is still in good shape at the same time. If you only change one part and other parts are in bad shape, there's the possibility that there will be a new failure soon!

Some important matters:

- Clean the outside of the engine properly before you open it. Any dust or dirt which gets into the engine could make considerable damage.
- Check the conrod frequently. If you want to replace the conrod, be sure the big end of your crankshaft is still round and at a good size. If not, also replace the crankshaft.
- When you start putting your engine back together, make sure that each part is totally clean before installation and please use some oil (after-run is suited well) to lubricate everything.
- Be careful that each part has its correct direction, especially piston/liner/conrod. Please also check the explosion drawing. The lubrication hole in the conrod should be facing to the front (direction to the carburetor).
- Before you install the combustion chamber, please doublecheck that you installed all head shims.
- Use a hex wrench to install the screws. When you start to feel resistance, stop turning the screw. Repeat this for each screw, use the star-technique to tighten all the screws completely. Do not overtighten them!

12. TROUBLE SHOOTING GUIDE

PROBLEM	REASON	SOLUTION
Engine does not start	Glow plug defective	- replace glow plug
	Glow plug does not work properly	- check the condition of the glow plug - check the glow plug igniter
	Engine is set too rich (too much fuel, hits back)	- check carburetor settings, repeat tuning procedure - unscrew the glow plug completely and use startbox for 5sec
	Engine is too lean (too little fuel, does not start)	- check carburetor setting, repeat tuning procedure
	Engine doesn't suck in the fuel	- check the fuel line for possible damage - check the carburetor setting
Engine stops after a short time after glow plug igniter has been disconnected	Glow plug defective	- replace glow plug
	Bad fuel	- replace fuel by fresh and correct type of fuel
	Bad carburetor setting	- check the carburetor setting, repeat tuning procedure
	Dirt in fuel line or carburetor	- clean fuel line, clean & check carburetor
	Fuel line damaged	- replace fuel line
	Loose glow plug or cooling head	- tighten glow plug and/or cooling head
	Air filter old or dirty	- clean or replace air filter
Performance decreases after reaching operating temperature or engine stalls from time to time	Engine is set too lean	- check the carburetor setting, repeat tuning procedure
	Glow plug defective or wrong type	- replace the glow plug by a correct type
	Engine runs too hot	- run-in process is not completed
	Shims under comb. chamber wrong	- check number of shims
Engine still keeps running at high RPM for a moment when you release the throttle	Bad carburetor setting	- open mid-range needle ¼ turn at a time and re-adjust idle-speed - set idle speed lower
	Glow plug, wrong type (too hot)	- use glow plug with higher number (e.g. go from 5 to 6)
	Shims under comb. chamber wrong	- check number of shims

REPAIR PROCEDURES / LIMITED WARRANTY

All products from LRP electronic GmbH (hereinafter called "LRP") are manufactured according to the highest quality standards. LRP guarantees this product to be free from defects in materials or workmanship for 90 days (non-european countris only) from the original date of purchase verified by sales receipt. This limited warranty doesn't cover defects, which are a result of misuse, improper maintenance, outside interference or mechanical damage. This applies among other things on:

- Engine disassembly by customer
- Any modification of the engine done by the customer
- Rust inside the engine
- Dust or dirt inside the engine
- Damaged engine due to glow plug failure
- Overheating
- Scratches inside the engine caused by dirt or dust
- Water in fuel
- Wrong break-in procedure
- Damaged piston due to piston stop devices
- Damaged cylinder exhaust port due to piston stop devices
- Breakages at high rpm without engine load

To eliminate all other possibilities or improper handling, first check all other components in your model and the trouble shooting guide, if available, before you send in this product for repair. If products are sent in for repair, which do operate perfectly, we have to charge a service fee according to our pricelist.

With sending in this product, the customer has to advise LRP if the product should be repaired in either case. If there is neither a warranty nor guarantee claim, the inspection of the product and the repairs, if necessary, in either case will be charged with a fee at the customers expense according to our price list. A proof of purchase including date of purchase needs to be included. Otherwise, no warranty can be granted. For quick repair- and return service, add your address and detailed description of the malfunction.

If LRP no longer manufactures a returned defective product and we are unable to service it, we shall provide you with a product that has at least the same value from one of the successor series.

The specifications like weight, size and others should be seen as guide values. Due to ongoing technical improvements, which are done in the interest of the product, LRP does not take any responsibility for the accuracy of these specs.

LRP-Distributor-Service:

- Package your product carefully and include sales receipt and detailed description of malfunction.
- Send parcel to your national LRP distributor.
- Distributor repairs or exchanges the product.
- Shipment back to you usually by COD (cash on delivery), but this is subject to your national LRP distributor's general policy.